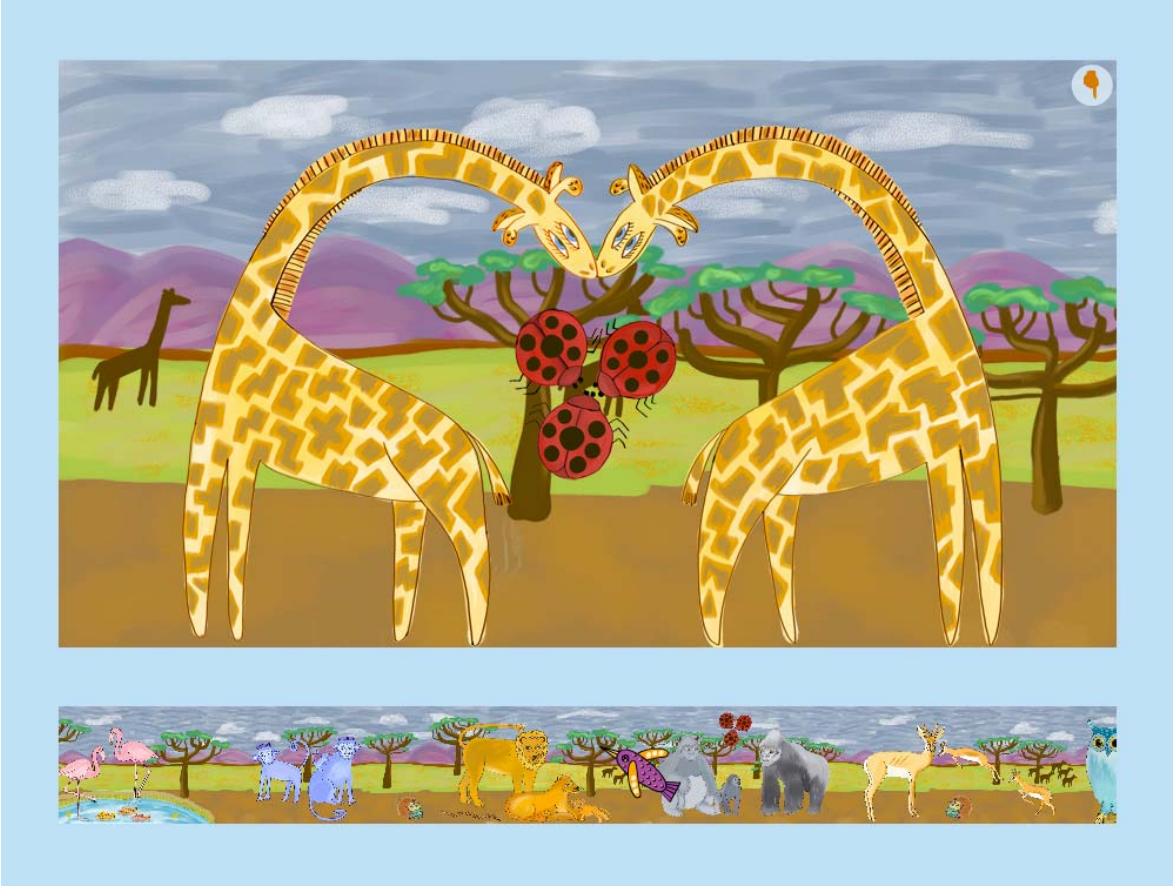
An investigation of Interaction Design principles, for use in the design of online galleries.



A Research Project submitted in fulfilment of the requirements for the degree of Master of Arts by Research Project

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Abstract:

This research is the culmination of a four-year investigation and analysis into the principles of Interaction Design, particularly those that are found to be most suitable when designing and developing interactive navigation systems. The research was undertaken as a Masters degree by project. The project consists of a CD containing an online gallery showcasing works of art and an accompanying exegesis.

The exegesis is structured into seven chapters, which consider, analyse and define what the key characteristics of Interaction Design are, where it comes from, and how it improves the quality of interactive multimedia applications. The exegesis includes four case studies that look at how other practitioners in the digital realm have created systems for showcasing narrative or creative content online. I examine alternative artworks and how they have shaped the development of creative media. I investigate what experts in the field define as good Interaction Design and what guidelines and principles they recommend. I show how these guidelines conflict with more creative approaches and how good design and creativity can be merged to be usable and friendly to users. I also look at the history of opponents of guidelines and principles and how their contribution helps make design better.

By creating the example gallery I aim to help designers working within the field of ID to understand the principles behind good design in order that they may deliver higher-quality user experiences relevant to the content they are displaying. By creating this gallery I also hope to help artists understand the principles behind good design in order that they may showcase their artworks in ways appropriate to their artwork. By designing and building an example I aim to provide a better understanding of how to construct a feature-rich application in an easy to use and understandable environment.

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Table of Contents

Table of figures

1. Introduction

This research investigates and analyses principles of Interaction Design, particularly those that are found to be most suitable when designing and developing interactive navigation systems. The purpose of this research is to investigate current practitioners in the field and to then design an online gallery. Using principles of good Interaction Design I hope to improve the quality of interactive multimedia applications. By creating this gallery I hope to help designers working within the field of ID to understand the principles behind good design in order that they may deliver higher-quality user experiences relevant to the content they are displaying. By creating this gallery I also hope to help artists understand the principles behind good design in order that they may showcase their artworks in ways appropriate to their artwork. By designing and building an example I hope this research will provide a better understanding of how to construct a feature-rich application in an easy to use and understandable environment.

With the advent of software such as Macromedia Flash and the development of technologies that allow designers to give users more control, and deeper levels of interactivity, there are more and more examples of interactive materials. The problem is that many are poorly designed and often do not function as intended. This leads to frustration and a poorer user experience. As a practitioner and artist concerned with the quality of the experience, and the one who perceives a deficiency in ID in its current form, I intend that this research should promote a greater understanding of the principles behind ID, so that they can be passed on and make a contribution to improving the wider body of knowledge in the field of ID. The research incorporates the design and development of a navigation system, which will describe and demonstrate those principles found to be most appropriate for use for that system.

Interactive applications contain features; the challenge is to investigate these features in navigation systems to determine if they are presented in a way that allows the user to fulfil the task the application was designed for. I will refer to the existing body of thought of key theorists such as Shedroff, Moggridge, Crampton Smith, Nielson and Nelson on design principles and my own understanding of what constitutes good design to interrogate whether or not the examples under investigation allow a user to complete the task they were designed for.

The research focuses on the investigation of navigation systems and the production of a prototype that sits between two extremes. The investigation will be accompanied by explanations, supporting examples and screenshots demonstrating the principles in use. The prototype will be iteratively designed and developed through several versions. This will help formulate a better system with the intent of producing a more pertinent example.

(See Appendix 1 for screenshots)

I will be presenting four case studies that explore good design and will then use the resulting information to construct an online gallery using what I have learnt. My research questions what the key principles of current Interaction Design are and what contribution an iteratively-designed prototype can make toward showcasing and demonstrating these principles when presented in the mode at the core of this research - an interactive media work. I will conduct case studies to explore good design. This document is meant to accompany the project that is on the accompanying DVD. The project can be navigated through by clicking in the index.html file to open it in a browser window. I would recommend that you browse the DVD as this will help place this thesis in context to the project. The rest of this document is arranged in order from where I first started my research into what Interaction Design is, how navigation systems work, the development of the continuum I developed to help understand where a body of works sits in the digital world, to the development of my own on-line gallery and concludes with what the future may hold.

2. Defining Key Interaction Design concepts

Interaction Design, usability and accessibility are three concepts that are linked together, in that one informs the other. Good design leads to better usability and that in turn leads to systems being more accessible. I hope to create an online gallery that is informed by good design and the three concepts of Usability, Accessibility and Interaction Design. My background in fine art will help me create the artwork needed for the gallery and my experience with Interaction Design and multimedia coupled with what I learn from experts by exploring concepts will aid me in creating the interactive interface to showcase the artwork. The following definitions help to make it clear how the interface work should function.

2.1 Usability

Nielson, an acknowledged Usability expert defines usability as (Nielsen 2006) “a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process.”

Nielsen also identifies usability criteria as often determined by user satisfaction, ease of use and quality. For something to be deemed usable, it has to fit certain criteria, such as being intuitive and efficient. Usability is the ease with which some-one can use or interact with anything from web content to a mobile phone to a vacuum cleaner. The less effort that is spent on working out how to use some-thing relates directly to how usable the object is. Users should be able to use their own common sense to figure out how things work.

Norman (Norman 2004) approaches interaction design from a broad interface design perspective. He examines appliances and points out that some are difficult to use because of poor usability design. He describes examples of objects that are hard to use in his book “The design of everyday things.” We have all had experiences with how hard it is to use some of the everyday things we are surrounded with. To understand more fully what usability is, one should consider some everyday experiences we have of some of these products that are hard to use.

- ☐ VCRs that we can't program
- ☐ cameras we cannot use to take a useful photo with
- ☐ watches we cannot change the time on
- ☐ fridges that order groceries online (or don’t - you are never certain if they will)
- ☐ websites where it takes ages to find what we are looking for

Some things are a constant struggle to use and we find ourselves repeatedly

having to read the manual or ask our colleagues and friends to help us figure out how to get them to work. Others work without problems, and as a result, blend into the background as we go about our daily tasks. The difference between difficult-to-use products or systems and those we don't have to think about using is usability. In other words, usability is ease of use.

Nielson sums it up by stating, “Usability is a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process.” (Nielsen 2006)
In other words, usability is the measure of the quality of the user experience when interacting with something, not only physical objects in the real world that Norman describes, but in the digital realm as well. Usability is often determined by user satisfaction, ease of use and quality. For something to be deemed usable it has to fit certain criteria such as being intuitive and efficient.

Looking further, there are formal recognized international ISO standards that are used to definition usability. One of the standards that relates to usability states:

> The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use. (ISO committee 2003)

Dey Alexander, a Usability expert who has pioneered the awareness of Usability and Accessibility in Australia and whose workshops I have attended explains further that the key terms to note in this definition are: (Alexander 2002)

- ☐ effectiveness: are users able to achieve their goals, fully and in the manner expected, when using a product or system?
- ☐ efficiency: how much effort is required to use the product or system?
- ☐ satisfaction: was the user satisfied with the product or system?

Another way to look at Usability is suggested by Whitney Quesenbery (Quesenbery 2004) who has stipulated, that a useful way to think about usability is to consider the 5 Es of usability:

1. Effective
2. Efficient
3. Engaging
4. Error tolerant
5. Easy to learn

Effective:

Is the software useful and does it help users achieve their goals accurately?
To be effective, a product or system must allow and assist the user to complete the task fully and accurately.

Efficient:

Efficiency is the speed (with accuracy) with which work can be done. Efficiency in the digital realm may be a subjective judgment of when a task is taking “too long” or requires “too many clicks.”

Engaging:

A simple definition of engaging is how pleasant, satisfying, or interesting an interface is to use. To be engaging, the user must have a good and satisfying experience when using the product or system.

Error Tolerant:

Error tolerance involves how well the product prevents errors and helps users recover from any errors that do occur.

Easy to Learn:

Ease of learning concerns how well the product supports both initial orientation and deeper learning. Was the interface consistent, so that once a user learnt how to use part of the application, they were able to easily learn how to use another part?

All of these definitions indicate that designers need to be aware of who the users of their product or system will be. They must also understand the users goals in using the product or system. And designers must also be aware of the context in which users will use the system. There seems to be no place for a one size fits all approach.

One has to acknowledge that systems and products are designed for a specific group to achieve specific goals in a certain context. An application or website may on first impressions seem to be not very usable, this may be a deliberate act of the designer of the site, it may be that the system is perfectly usable for the audience it was designed for. Not every one wants to use only commercial products all the time, where every aspect is transparent and easy to grasp, sometimes people want to investigate, explore, analyse and be challenged. It all comes down to the context of the application and the target audience. Examples of this are non-commercial

narrative sites, portfolio sites, sites created by artists as works of art. In these cases the end user, their expectations and level of skill override set standards.

MySpace, (http://www.myspace.com/) is probably the best example of this, it is a social networking website offering an interactive, user-submitted network of friends, personal profiles, blogs, groups, photos, music and videos. Nielsen (Nielsen 2006) acknowledges that it is probably the most famous anti-usability site that has been successful. It breaks all the rules of Usability, but it works because it's not trying to attract customers, or help users accomplish a task such as home banking. The target audience is people who are interested in social networking; they are fascinated by what they can do on the site despite its lack of usability. In his column in Business Week online, Jesse James Garrett, (Garrett 2006) author of *The Elements of User Experience* and frequent keynote speaker and writer on user experience strategy asks the question “What do users want?” He says the real mystery is whether MySpace was constructed in the way it is on purpose. To a professional, it looks like there is no master plan behind any of the haphazardly arranged features. And maybe, he says “that's O.K.” and that “The MySpace team has demonstrated that they're in tune with their audience by focusing on features that really matter to users. They have crafted an experience that acknowledges what users care about and the rest does not seem to matter.”

I can only conclude from all the standards and design guidelines regarding usability that one has to strive for creative expression and where possible to make ones work as easy to use as possible, without compromising what one is trying to achieve.

2.2 Accessibility

Often, when people think of accessibility, they think of things like wheelchair ramps and subtitles on television. This is because these sorts of accessibility features stand out and are used by those with obvious disabilities. However, accessibility features aren't designed just for those with the most severe disabilities. Among US computer users who range from 18 to 64 years old, 57% (74.2 million) are likely to benefit from the use of accessible technology due to disabilities and impairments that may impact computer use. ("The Market for Accessible Technology: The Wide Range of Abilities and Its Impact on Computer Use," Microsoft Corporation)

Accessible features in the real world are able to turn up a phone’s volume to allow people with mild hearing loss to use their phone more easily. A handrail on a flight of stairs allows a mobility-impaired person to climb them more easily.

The Web Accessibility Initiative (WAI) has defined accessibility of websites and laws have been passed to regulate accessibility of online materials. Websites need to comply with these laws or the owners of the sites can face legal action.

Web Accessibility Initiative (WAI) (http://www.w3.org/WAI/) states that Web accessibility means that people with disabilities can use the Web. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web.

Accessibility in the digital world is allowing information to be delivered through sight, sound, touch and multi sensory systems. Accessible systems are aimed at people who are unable to access information easily through conventional means. Accessible content can be delivered via alternative assistive technology such as voice/speech recognition, mouse navigation, screen readers, links, lists and a variety of diverse communication devices and technologies. An accessible site should allow anybody using any kind of assistive technology to have the complete ability to interact with that site and gain a complete understanding of all information contained there.

It is obviously difficult to provide these sorts of features and for a single person to implement them, but it is a responsibility of the designer to make sure that the content is able to be viewed in different ways. Solutions need not be time consuming or costly, the use of the alt tag on websites is an example of an easy to implement solution for screen readers. Large projects using touch screens in a library or museum would be deemed accessible. Another way to make navigation systems accessible, like in my gallery, would be to use tab keys to go through the navigation system one by one.

2.3 What is Interaction Design?

Gillian Crampton Smith the Director of Interaction Design Institute Ivrea says in an interview on January 30, 2002 “In the same way that Industrial designers have shaped our everyday life through objects that they design for our offices and for our homes, interaction design is shaping our lives with interactive technologies - computers, telecommunications, mobile phones and so on. If I were to sum up interaction design in a sentence, I would say that it’s shaping our everyday lives through digital artefacts – for work, for play, and for entertainment.” (Moggridge 2007)
Crampton goes on to say that Interaction design is the design of things and systems where computing and telecommunications are the typical combination. Relatively inexpert users

should be able to interact efficiently, transparently and pleasurably with technology. This is similar to what Nielsen has to say about Usability, regarding user satisfaction, ease of use and quality making it obvious that these fields overlap.

In 1973 the field of Interaction design was conceived at the Palo Alto Research Center, California. The history is documented on their website in the history section, which states:

> The Alto personal computer becomes operational. As it evolves, the Alto will feature the world's first What-You-See-Is-What-You-Get (WYSIWYG) editor, a commercial mouse for input, a graphical user interface (GUI), and bit-mapped display, and will offer menus and icons, link to a local area network and store files simultaneously. The Alto will provide the foundation for Xerox's STAR 8010 Information System.(PARC 2006)
>
> Personal distributed computing is invented. PARC's vision of computers as tools that could help people work together will change the course of the computer industry and lead to new ways of organizing interactions to support both individual and collaborative work. (PARC 2006)

Interaction design as it's own field has a very short history. Born at Xerox Parc (Palo Alto Research Center) in California from 1973, as stated above, it grew from an unusual mix of engineers, programmers, product designers, psychologists and anthropologists. This mix gave interaction design a creative culture, which, at its best, is characterised by pragmatism, creativity, and a light touch.

Crampton calls these the 'Californian Virtues':

- **Pragmatism** – making prototype after prototype and iteratively testing them until one works.
- **Audacity**. Without audacity you make nothing new: you remain an imitator; you avoid the risks and remain mediocre.
- **Lightness of touch**. Invention and innovation thrive on playfulness and optimism.

Crampton's other desirable and balancing qualities are 'European' virtues and include the following:

- **Quality**: intensity of craft, individuality of experience, the value of the local as well as the universal, of the art of made-to-measure tailoring as well as *prêt-à-porter*, of slow as well as fast food.
- **Elegance**: the discriminating perception of the present state of an aesthetic language, and a controlled contribution to its future development.

To combine all these things into an elegant, fun, stimulating, high quality experience is not an easy challenge for engineers, designers and business people. The best example of this could arguably be the new Apple i-phone to be released in Australia next year. The huge success of the i-Pod seems to portend that the i-Phone is set to revolutionise the mobile phone industry.

The future of Interaction Design is open. Technology, markets and society change unpredictably; new challenges and opportunities emerge constantly. Technology, markets and society are also continually evolving. Over the last decade the convergence of computing with telecommunications, especially mobile telephony and the Internet, has increased the significance of communication. The boundaries between business and everyday life have become blurred, as have the boundaries between information and entertainment, between work and leisure, between public and private life, the real world and the virtual environment. Interaction Design and the way we use and interact with technology increasingly shapes the self-identity of individuals and their relationship to society.

This can be seen in the example of Anshe Chung, the virtual land baroness, who has become the first millionaire in Second Life, a 3-D virtual world entirely built and owned by its residents. (www.secondlife.com) Since opening to the public in 2003, it has grown explosively and today (15 March 2007) is inhabited by a total of 4,638,846 people from around the globe. Anshe Chung, inhabiting the virtual realm, has become a millionaire in real U.S. dollars. Her real-world persona, Ailin Graef, estimates her real life net worth based on her substantial in-world land holdings, cash in "Linden dollars," which can be converted to real cash, as well as virtual shopping malls, store chains, and even virtual stock-market investments in Second Life businesses.

As the release from Plush City in the Second Life realm and Wuhan, China, in the real world explains:

> Anshe Chung's achievement is all the more remarkable because the fortune was developed over a period of two and a half years from an initial investment of $9.95 for a Second Life account by Anshe's creator, Ailin Graef. Anshe/Ailin achieved her fortune by beginning with small scale purchases of virtual real estate which she then subdivided and developed with landscaping and themed architectural builds for rental and resale. Her operations have since grown to include the development and sale of properties for large scale real world corporations, and have led to a real life "spin off" corporation called Anshe Chung Studios, which develops immersive 3D environments for applications ranging from education to business conferencing and product prototyping. (media@anshechung.com 2006)

Without the interface of the Second Life world, Anshe would never have become a millionaire. The online environment enabled her to make such a success of herself. This shows how the boundaries between the real and online worlds are being blurred. An online world can be a place where people live in a virtual realm and spend hours in the real world interfacing with the

imaginary one through their computer screen. Good interaction design creates a better experience for them.

Cooper puts another definition of ID forward: “Interaction Design is the investigation into the definition and design of the behaviour of artefacts, environments, and systems.” (Cooper 2003). The keyword in this definition is “behaviour” - what actually happens when the user provides some form of input. It is up to the designer of the system to ensure that the user can easily use what is being presented. In my gallery I am trying to create a world where the system behaves in a way that is relevant to the design and concept of what is being presented and is also creative. A set of buttons down the left hand side of a page may behave in a predictable way, but is pretty boring to the user. Navigating while flying through a landscape is much more fun and is in context with the theme of my gallery.

In the book ‘Designing from both sides of the screens’,(Isaacs and Walendowski 2001) Interaction Design is likened to the relationship between a butler and their employer. The butler is always available and does what he is asked to do with no complaints or questions. If there is a problem the butler fixes it. The employer, or user, observes what the butler does well and what he is unable to do and tailors their requests accordingly. In this world the butler should act like the perfect butler, a stereotypical one that you would see in a movie. The relationship between user and screen environment can act in the same manner. It is about finding ways of supporting people in the tasks they wish to carry out using an onscreen interface. In contrast, like our fictional lord of the manor, the user should only ask what is possible of the butler. Some people make unreasonable requests and become frustrated when the impossible is not delivered. Others become frustrated when a seemingly reasonable request is not met by the technology they are using. And some users simply eventually tailor their requests, based on past bad experiences, to be increasingly limited by each experience, when they are disappointed by the inadequate response.

Isaacs and Walendowski argue that when technology you are using or the website you are exploring does not respond how you want it to, and you have repeated experiences of disappointment, eventually you will stop looking for the functions you really want and be satisfied by the mediocre. This is where good Interaction design can step in to stimulate and excite the user and help them achieve their goals, be it playing a video, viewing photos or banking online.

I will use the relationship of butler and master in my design of the gallery, by having an environment, that responds to the users’ mouse clicks. In the interface, there is a bird that acts as a host and follows the mouse. This will personalise the experience beyond that of just

clicking somewhere and waiting for the action to occur. I hope to portray the feeling of the bird character as well as that of the butler.

2.4 Interactive multimedia

Multimedia can be distinguished from traditional media such as movies, by the scale of the production. Usually it is intended for an audience of one, it engages the audience through interaction and involvement. When viewing a movie, the audience is passive. They sit and watch. When viewing multimedia, the audience is engaged with with what is being presented; there is participation usually through mouse clicks and making choices. Interactive elements can include: voice command, mouse manipulation, text entry, touch screen, video capture of the user, or live participation (in live presentations). More exciting and dynamic input methods such as those devised for Collabolla (see figure 1), a video game with Spacehopper balls as input devices is one example being developed at Interaction Design Institute Ivrea. The player sits on a ball and hops around to navigate a Pac-man type of game. Here again the boundaries are being blurred between what is real and what is happening on screen and in the imagination of the player. I used this as inspiration, hoping that in the way the game engages the player through participation. My gallery engages users and allows them to feel that are actually going on a safari to view the artwork being displayed. (see accompanying CD)

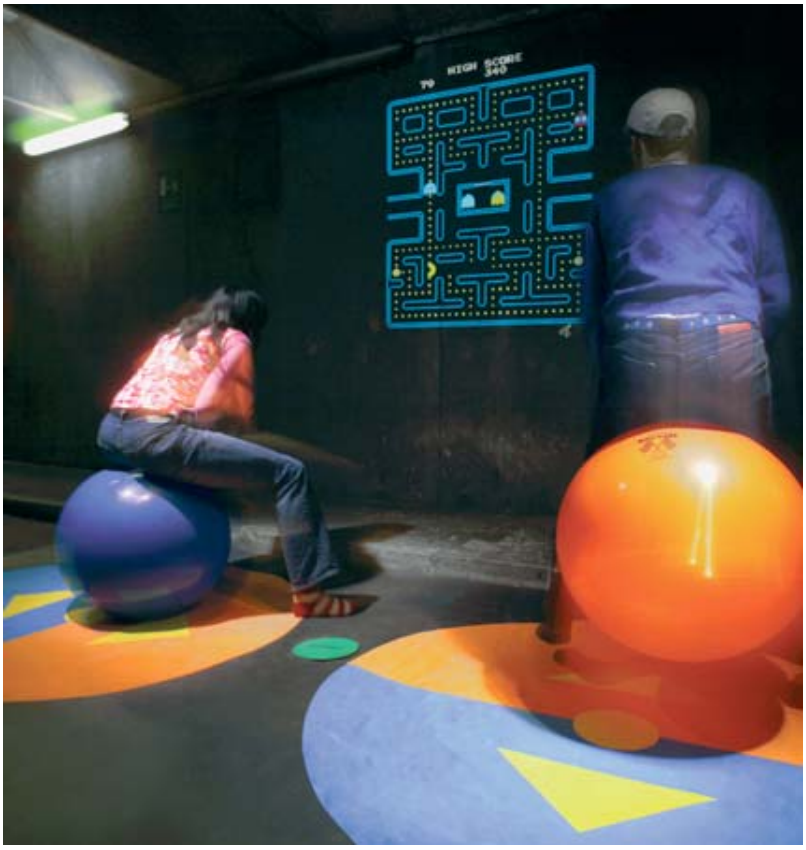

Figure 1 Space hopper game
http://www.designinginteractions.com/img/chapters/ch_foreword.jpg

Interactive multimedia allows for two-way interaction with materials such as games, or learning materials, a database, another person on a different computer, or a programmed interface. The interactive elements may include animations, text input, manipulating objects with the mouse, touch screens, voice commands, video, sound and real-time interaction.

The internet, computer games, virtual reality are all examples of Interactive media; the user becomes involved and actively engaged with what is on their screen.

Benefits

The benefits to having interactive media are that the environment is more enjoyable and flexible, as well as being of a high quality, which actively engages the user. The delivery of materials is also more flexible; they can be delivered via the web or on CD-ROM. This flexibility means that the user has the freedom to use the interactive materials at a time that suits them. Users react, remember and learn through involvement. People learn more creatively through exploring at their own pace. The learning is on a more personal level, it is ‘owned’ or controlled by the user by making it their personal experience. Retention is doubled when sight and sound are used in conjunction. Dynamic information can be illustrated via animations or video clips, e.g. how the heart works, how it sounds and looks can all be shown at the same time.

Types of interactions

Quizzes, drag and drop activities, dynamic and changing database driven interfaces, animations – triggered by user interaction, user driven interfaces through menus and navigation and text input are types of interaction that can take place.

Even simple illustration is stimulating on an otherwise plain site and demands eye movement and multiple focusing on different areas of the site, encouraging further exploration. The way in which illustration, colour and types of text are arranged on a website actively define and determine the way in which a user will look at that site. Like in an artwork, there are focus points, multiple or singular, which users will return their visual focus to periodically and in the order of ‘strength’ of the point. Lines of sight and focus can be created with strong lines or patterns and disinterest can be fostered as easily as interest.

3. Navigation systems

A navigation system allows a user to interact with what they see online and allows them to interact with the content. Without some input system and feedback, the system is useless. Operating systems like Windows and Mac OS allow users to navigate to programmes, files and folders through an interface that may at times not even seem to be a navigation system at all. When you click on an icon, the computer finds what you want and finds it's way to the file or programme that you want to open. The system does the work for you; in early systems like DOS you had to find all these files and programmes yourself. A navigation system forms the core of my Gallery, it is the means by which users can view the art works and open the links to poems or view animations.

3.1 What is a Navigation system?

Examples of navigation systems are:

- ☐ Books, indexes, tables of content, archives, filing cabinets
- ☐ Road signs and traffic signs
- ☐ Maps, page number, grid reference
- ☐ Organising digital information for easy retrieval in folders and files
- ☐ Overview of information like a table of contents
- ☐ Site maps
- ☐ Web based menu bars
- ☐ Mobile devices and GPS systems like TomTom, a satellite navigation system replacing conventional maps

In the digital realm we have learned to use navigation systems through our use of graphical user interfaces. Clicking on an icon that represents an image opens that image in a programme. We are finding our way, or letting the computer do it for us, towards our goal. Sometimes we have to let the computer know what we want it to do by telling it that certain files with a specific extension should open in a certain programme. Once we have told it this, we have created a shortcut for ourselves and the system will navigate to the programme and open the image on its own the next time.

> Wayfinding is what people do as they find their way towards their goal (Tidwell 2006)

In the digital realm, Tidwell talks about signposts as being features, which help users figure out their immediate surroundings. Common signposts are logos on a lower level page that take you to the home page, tabs that show what section you are in. Annotated scrollbars, like Microsoft

Word uses to show what page you are on, or colour coded sections are all devices to tell a user where they are and what section they are on.

Because of the nature of a digital interface, there almost always needs to be some kind of navigation system in place, to allow users to go from place to place. This can be a simple visual menu system that allows users to click on descriptions and links those words or images to other web pages or areas of an interface. These usually have a rollover effect, in that you see a little hand replace the arrow cursor. This gives the user a clue, that there is something there to click on.

This has become an expected system, which has been taught to the public consciousness, without which confusion and inability to navigate would immediately arise. Users may not even be able to articulate what it is that is preventing them from navigating the site with ease, rather than frustration. This is simply one of the many now every day effects, interactions or navigation systems, which are expected of a functional site. To truly break free of societal norms and systems, a website would not only have to creatively invent new interactions which may at first confuse, but eventually enlighten users to those new ways of viewing not only their site or the web, but the world itself. The web is, as we often forget, simply a gateway to our own world as well as our imagined, creative worlds.

Whether creating a normal or creatively inventive site, one of the keys to a successful interactive interface is knowing what you want to achieve and to design a system to help your target audience find their way around your website or interaction. A clear, simple easy to use navigation structure is usually all that is required.

There are times, when a site might benefit from alternate forms of navigation. Tools like shortcut menus, breadcrumb trails, site maps, hotspots (visible and hidden) and indexes are all different ways to allow users to navigate. The design of the interface may lend itself to using some of these systems as an alternative to a menu bar.

3.2 Visible and invisible hotspots

These are areas where the user can click to activate some sort of action. Where it is clear to the user that there is a link, it is a visible hotspot. Hidden hotspots would only show up when the mouse is rolled over an area and the cursor changes to a hand or custom designed cursor. There are many sites where you get no clue as to the fact you have the mouse over a clickable area; these are almost always frustrating, as you end up clicking all over the place, hoping to activate some hidden area. This only works well and should be used in very few special cases.

One example of this type of hot spot being successful would be if there were visual or written clues that allowed you solve some sort of question or riddle.
Use of sound to announce the hot spot is sometimes not a good practice, since many computers have sound turned off – e.g. in an open office environment. Again – it is important to know and understand the user.
The hidden hotspot is often used in the game genre where clues are revealed, or treasure is found. My Gallery uses hidden hotspots in the navigation. The entire thumbnail area consists of a series of invisible hotspots, that when clicked accelerate the landscape at the top to the specific area chosen. (See Appendix 1 for screenshots).

There are times, however, if not properly used, where these tools can hinder and confuse. Depending on the kind of site you have, the size of your site and complexity of your information architecture, it may be a good idea to use only one of these tools. Many sites that are small and simple don't need more than one of them, unless they are integral to the design. Too many pathways can become overwhelming and confusing to users. My Gallery is a relatively simple site, and uses one form of navigation, the hidden hotspots. This keeps the interface simple and easy to use; often too many paths to the same place lead people to believe that there is much more to be seen and the navigation becomes confusing.

3.3 Site Maps

A site map is a linked representation or chart, usually used on a conventional website, of that website's information architecture, organized in a hierarchical manner. There are different ways to implement a site map, but in general the point is to have an index of the site. Whether the index itself is a link system or one which simply shows a tree structure of how the links work and defines how the designer wants the user to interact with the site. Some sites want the user to actively go through each level of the site before they get to the deeper levels. In the real world (Tidwell 2006) some people like to follow signs, others like to know what the layout of the whole area is so they can orient themselves in a larger frame of reference. This is what a site map tries to achieve. In some cases however a user who uses a clickable index to go directly to the information they want may miss the context in which the information is meant to be understood.

3.4 Shortcut Menus

A shortcut menu can be used for a variety of purposes, but in general it's a small subset of links to commonly used tools or pages within a site. A tool link could be one that allows the user to change the font size of the site being viewed, or to skip to the content area of the page they are viewing, bypassing banners and images. As a quick link they can be very helpful to frequent users of a site who enter in via the home page and then quickly go to, for example, the story of

the day, weather news etc on a website. Thus they have some personal ownership of the site and they are encouraged to use it more frequently, knowing they can get what they want quickly and with no hassles.

3.5 Breadcrumb Trails

For example: Home » Students » Library
Breadcrumb trails probably get their name from the Hansel and Gretel fairy tale. They can be used as supplemental navigation, but in general their main purpose and usefulness lies in their use as a way-finding tool. A breadcrumb trail is a list or line of text, (see example above) usually linked to the pages in the links, which shows the user where they are in a site and where they have been. Thus they can refer to it, hopefully remember it, and access the same information next time they come to the site. It also helps a user locate themselves and clearly see the context in which they have been placed.

3.6 Supplemental Navigation Systems

Supplemental navigation techniques, by definition, enhance the primary navigation structure. Tools I have discussed like shortcut menus, breadcrumb trails, site maps and indexes are all different ways to help users find what they are looking for in ways that supplement the main system. My gallery uses supplemental navigation to open icons that allow users to read a poem about each painting. It is important, as Robinson points out, to ensure that all primary areas are covered in the most direct way, through the main navigation system.

> No supplemental navigation tool can take the place of a good information architecture coupled with a clean, easy to use primary navigation system (Robinson 2003)

Having defined some of the key terms in Interaction Design I will be covering some alternative navigation systems in the forthcoming chapters and discuss how they have informed the design of the gallery.

4. Alternative Navigation systems

There are many examples of alternative interactive navigational systems to be found on the World Wide Web. Some are more engaging than others, some are easy to understand and others are intriguing and complex, yet rewarding once one comes to grips with what the designer is trying to convey.

4.1 Viral Marketing

One type of alternative, narrative, interactive system that is very engaging was a viral marketing campaign used to promote the game Halo 2. The campaign began when the Halo 2 trailer appeared in movie theatres across the USA. Observant gamers noticed that the Xbox logo URL that appeared at the end of the trailer was briefly replaced with www.ilovebees.com. Those who noticed the URL went home and looked it up. What they found on the i love bees site was the start of an alternate reality game (ARG), a game that blurs the distinction between the game and reality. As time went on the site got weirder and weirder, as if being hacked by a malevolent force from another world. GPS coordinates and times began appearing on the site, corresponding with payphone locations at major metropolitan areas in the U.S. Listeners at the phones at the specified times would be asked questions by a recorded voice, and as the game continued players began having conversations with real people on the other end of the line. The game left enough cryptic treasure hunt style clues to inform players where the next Halo 2 preview event would be held. Many websites and forums started, where discussion was held as to the story of the plot, code-crackers spent their free time trying to solve the mystery.

Another more recent example of this type of interactive online experience is Lonelygirl15 (http://www.youtube.com/profile?user=lonelygirl15). She is what appears to be a young girl called Bree, an innocent 16 year old who keeps a video diary and talks about what she and her friend Daniel have been doing. She then shares these posts on YouTube where 1,000,000 plus viewers followed her story. There was a lot of speculation about who she really was and why the videos were so well shot, scripted and edited with accompanying music and this raised suspicion that this was some form of marketing rather than kids messing around.

The very sophisticated scripted video of her first kiss is at http://www.youtube.com/watch?v=Kd15ku_BVR0. The way she gets around the sophistication of her videos, is that on her website she states “What can I say? Hmmm. My friend Daniel helped me set up this account and he helps me out with the videos (he's kinda a computer genius).”

Figure 2 Images from Lonelygirl15 videos
http://www.youtube.com/watch?v=Kd15ku_BVR0

It turned out that, as many suspected, lonelygirl15 had been fake. An admission was posted by the creators just a day after a story revealed a connection to a Hollywood agency. Lonelygirl15 was identified as Jessica Rose, a 19-year-old actress originally from New Zealand who had simply answered an ad placed online at Craigslist (a San Francisco bay website providing local classifieds) by Mesh Flinders and Miles Beckett, two filmmakers with a new art form in mind.

When found out, Mesh Flinders and Miles Beckett stated that they believed the public were witnessing the birth of a new art form. The post on the lonelygirl15 forum explains they are filmmakers that “aren’t a big corporation.” Bree it turns out is according to them “a reflection of everyone. She is no more real or fictitious than the portions of our personalities that we choose to show (or hide) when we interact with the people around us.”

The hoax has generated a lot of anger, people do not like to be tricked or taken in. By creating Lonelygirl15 as a work of fiction and passing her off as real, the whole purpose of her seems to have been defeated, can it be art if people have rejected the actual “art”?

As one blog entry said, A “new art form?” If pranks are art, I’m frickin’ Picasso.” (Safran 2006)

The New York Times, (Zeller 2006) asks the question, Prank, Art or Both? In his article he asks whether the Lonelygirl15 videos qualify as art.

> For people who want to tell compelling stories, and to have the freedom to depart from formulas and focus groups at a risk that’s acceptable, since the budget is low, the Internet offers an unparalleled canvas,” said Jonathan Zittrain, a founder of the Berkman Center for Internet and Society at Harvard Law School and a professor of Internet governance and regulation at Oxford. (Zeller 2006)

Zeller goes on to say that what the creators of Lonelygirl15 tried to do is create a “false documentary”, a narrative device meant to bring authenticity to a work of fiction such as the novel Dracula, a 1897 novel by Irish author Bram Stoker, which was told in the form of numerous documents, including journals and newspaper articles. A brief introduction claimed that they were all real.

Eileen Pollack an English professor who teaches False documents as a topic at the University of Michigan says

> If the author wants to truly fool his or her audience, it's not a false document. If the intent is just to say 'gotcha,' it's a prank. (Pollack 2006, cited in, Zeller 2006)

The author of a true false document, Eileen Pollack (Pollack 2006, cited in, Zeller 2006) said, "wants the audience to figure out at some point that it's being had, with the object of making that audience think about the nature of the reality."

The difference between I love bees and Lonelygirl15 is that on a deep level people knew that I love bees was a fiction, a fantasy, it became a work of art despite being a marketing ploy, the concept grew beyond what was initially conceived. Lonelygirl15 on the other hand turned out to be disappointing, a fraud. By the criteria defined by Eileen Pollack (Pollack 2006, cited in, Zeller 2006) Lonelygirl15 does not measure up as a work of art. There is no acceptance of it being an art form once it was revealed to be a hoax.

In contrast to the anger generated by Lonelygirl15, I love bees was loved by the audience it was aimed at, one of the designers of the game who goes by the name of Puppetmaster 2, reflects on the game on the forum set for public discussion:

> The thing that makes this form of art interesting and unique is that it depends upon a collective audience. It evokes a shared community who talk together and puzzle together and try to figure out what's going on, and become immersed in the world and the story.... This experience goes on for three months. It's pervasively in your life, so the suspension of disbelief is a bubble that extends out in the rest of your life and the rest of the community. (Puppetmaster2 2005)

4.2 Real world Artists

In the real world artists question conventional norms, sometimes in extreme ways like the artist Marc Quinn has. In the digital realm it is up to artists and practitioners to do this as well or the entire online world could end up being ruled by guidelines and principles set up by business and commerce. Many the of the greatest forms of art, such as Picassos cubist works, Andy Warhols's 'Campbells can of soup' and more modern displays at the Saatchi Gallery such as Marc Quinn's work 'Self' (1991) have been hated, and caused social outcry and disgust when first revealed.

Quinn's sculpture 'Self' (1991) (see fig 3) was created by the artist having eight pints, or 4.5 litres, of his own blood drawn from him over a five month period. During this time he constructed

a negative mould of his head, into which the blood was poured and then frozen. This ‘bloody’ head cast, now commonly known as the blood head, was exhibited within a glass container set atop a refrigeration unit. It was first exhibited in 1991 and then most infamously at the Saatchi Gallery in 1992 along with other boundary pushing artists.

The blood head references the tradition of death masks, most particularly the famous cast of William Blake's face. Yet as it has aged, the frost-bitten decay of the ears and nose of Self confirm its status as an extraordinary meditation on mortality. Repeatedly, Quinn has chosen to use his own body as a primary source, saying in an interview that 'the self is what one knows best and least at the same time, casting the body gives one an opportunity to "see" the self'. (Quinn 1998)

Figure 3 Quinn’s sculpture ‘Self’ (1991)
http://www.english.ccsu.edu/ barnetts/Publications.htm

It is true that neither this, nor the other works mentioned, were hoaxes or ‘fakes’ but the point is that true art is the ability and action of an artist to step away form norms and the fixed, socialised perceptions of society and show to people something they are not able to see themselves. Picasso, through cubism revolutionised the way we see the body and the self, particularly the face and the perception of space defined by the face. Warhol showed that everyday objects can be objectified into art, and Quinn comments on our mortality in a way which shows true dedication by the artist for their cause, whilst disgusting the audience and shaking them into at least noticing what he has to say. Not every artist will go to such extremes to engage their audience, but in the digital realm, as in real life, it is important to engage the

user with the artwork using the tools one has at hand in the digital realm. Understanding the workings and reasoning behind what makes an engaging interactive experience allows the creator to do this. In the real world there are problems with physical objects like space and dimension, paint and canvas and other materials. For the digital creator those challenges may be in the programming, screen size, screen resolution and all the elements of usability, accessibility, how navigation systems work and what good Interaction Design is. Having knowledge of these and of what the discipline involves allows digital content creators, as an artist who understands paint and canvas does, create a better experience and a well-designed system.

By creating an entirely fictional blog, Jessica Rose, Mesh Flinders and Miles Beckett are challenging perceptions in the digital realm, as did others in the physical art world before them, and forcing us to see the dis-reality and possible 'fakeness of other blogs and reality stunts. They are messing with the audience's fixed perceptions and opening their reality to new realms, which is the extensive fictional and narrative potential of the web.

4.3 Salon des Refusé

Sometimes we need to ignore convention and experiment to find new paths and directions. Salon des Refusé is an example where what was considered bad art by the 'experts', was considered good by the public. The artwork shown there was so radical for it's time it was considered too extreme to be shown in any exhibition. This very work laid the foundation for much of the entire modern art movement. The art exhibition was held in 1863 for works that had been rejected from the official Paris Salon. Emperor Napoleon III ordered the special exhibition to answer protests over the number of rejected works.

Paintings by Edouard Manet and James McNeill Whistler were among those shown. Innovative and experimental work often lays the foundation for what later becomes mainstream.

When it comes to web standards we need to remember that guidelines are just that, guidelines and no more and no less, they are not a set of rules that should never be broken. The web is a public domain; it is there for everyone. Artists and innovative thinkers have as much right to put their ideas out there as anyone else, traditionally they are the ones who challenge convention and guidelines, like those laid down by Nielson to create a more dynamic and creative culture. Ultimately the work speaks for itself and if it's bad the public will reject it. An example of this the myspace site already discussed and the notorious 'skip intro button'. Myspace is a success story despite its limitations.

There has been an entire book written on the subject of how to design usable, engaging sites and the phrase was coined from the name of the book “Skip intro : Flash usability and interface design” (McAlester and Capraro 2002). The skip intro button came about when site creators wanted splash pages before the website, as an entry point. Sometimes this was so the site could load while the audience was being entertained. What happened was that every second site suddenly seemed to have a long animated bandwidth-hogging page. There was so much public outcry and people were choosing to abandon visiting sites rather than wait that webmasters were forced to have a “skip intro” button on the splash page so people could enter the site immediately. Users wanted control back, a voluntary audience is a much more receptive audience. McAlester calls it ultra-excess in design and the bubble burst when Nielson announced that Flash, which was used for nearly all skip intro pages, was 99% bad.

So what I have learnt from this is that it is good to push the boundaries, it is almost my duty as a designer to challenge convention in order for those conventions to evolve. Nielson is today a Flash consultant helping write guidelines for its use. I have learnt that if a feature is badly designed or frustrating users will be the ones to suffer, and ultimately me when the public disregards my work.

5. The continuum

Continuum or dimensional models propose that some people are more extreme than others on particular dimensions. My analysis uses this model as a basis for determining the extremity of a site from conventional to creative, chaotic and extreme. A continuum is a useful way of conceptualising the level of interaction each site demands of the user. I have developed this concept based on my readings of Shedroff, Tidwell and other designers in the field.

The Continuum (fig 4) is an analysis of navigation systems, how the user interacts with the site, how they navigate through the site, how much control they have, how rewarding the experience is, what expectations the user has of the site, what expectations the site has of the user. In my research I take a close look at navigation systems that fall between the two extremes of the continuum and critically analyse them.

I will not be analysing commercial/business sites that would be totally conventional, the far left in this case starts with a site that may be already to the right of mainstream. Low cognitive cost sites would include commercial and business site that achieve Web Accessibility Initiative (WAI) guidelines and are fully tested and compliant with Usability guidelines. High cognitive sites include sites that use alternative forms and require a large amount of input from high end users of the web, these would include complex game sites where you navigate worlds and create characters online.

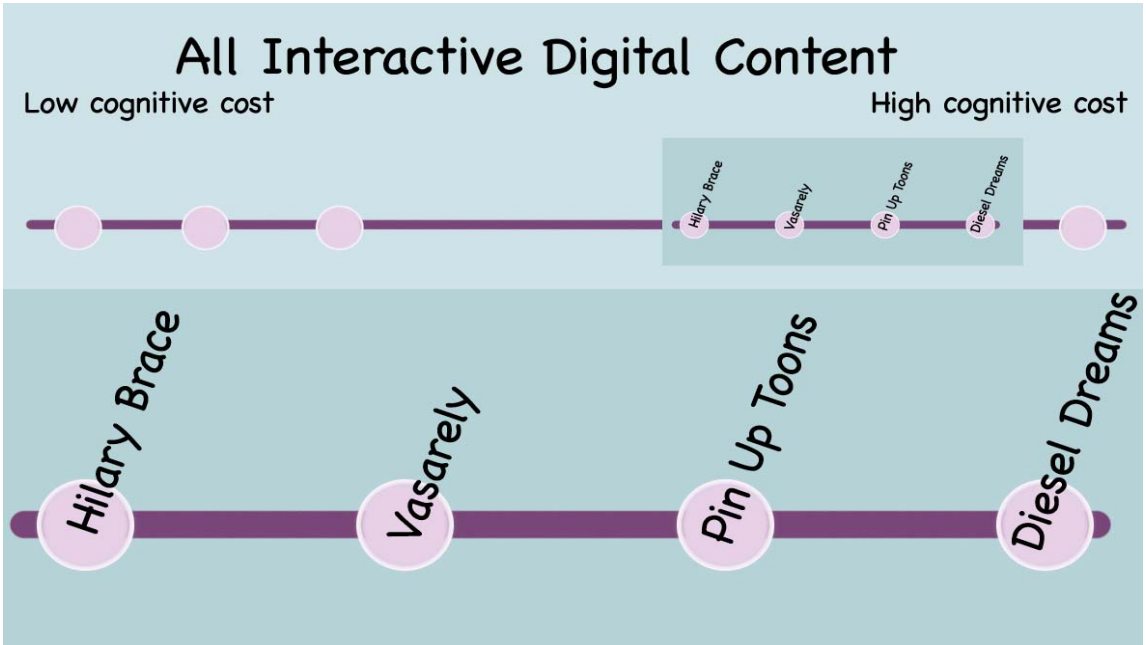

Figure 4 Graphic of the Contiuum and where it sits in the wider world

5.1 The far Left

These websites are more conventional. The navigation system is explicit and transparent. The users who would be targeted by this type of site are mainstream and the site only requires a low level of user commitment. The system is easy to use and there is very little out of the ordinary to be expected.

Tidwell in her book “Designing Interfaces” (Tidwell 2006) talks about the cognitive cost of navigation. To look at this cost and how it would work in the real world one can imagine that when you enter an unfamiliar room, you look around to orient yourself; you look to see the way out, where you can sit, where the light switch is. You quickly make assumptions about how it relates to you and your needs. The same thing happens when you bring up a web page, you need to figure out the new space you have entered, where do you click, how do you get back to where you were? This all incurs a cognitive cost; the sites on the left of my continuum incur a low cognitive cost. It may be that buttons are clearly marked and the site is easy to navigate.

5.2 The far Right

The sites to the right of my continuum are subtler; there may be parts you do not find, hidden aspects that take a few visits to discover. There is a complex structure that makes it harder to discover all that is there. The site is more conceptual and places more of a cognitive burden on the user. There is a high level of user commitment.

5.3 Questioning the cognitive cost of chosen sites

In my research I am taking a close look at navigation systems that fall between the two extremes of the continuum that are used in interactive systems, websites or multimedia interactions, and critically analyse them to see:

- ☐ who are the targeted visitors/users
- ☐ a comparison and contrast of the technologically mediated experience with the real world experience(s) it is derived from or competes with.
- ☐ define the experience ‘boundaries’
- ☐ how has the information been organized and how does this context provide meaning to its visitors/users
- ☐ what is the relationship between the data organization and navigation

- ☐ use of abstraction or reduction to create meaning
- ☐ in what way does the site demonstrate or not demonstrate the successful implementation of usability and accessibility principles
- ☐ how do the page layouts, aesthetic and choice of media reinforce these
- ☐ what could have been done to improve the site from all perspectives
- ☐ what works and what fails

My project builds a navigation system that falls in the middle of these two extremes. One that is engaging, requires a mid level commitment from the user, but still contains the unexpected.

Should every site 'conform' to sets of standards and guidelines laid out by experts. Who has the final word on this? Will that lead to a vanilla flavoured world? Should there be simple ground rules and if these fail, the interface needs to be rethought. Who determines that the system is a failure? The site may not serve a purpose that can be satisfied by following these rules. Yes, if it is a banking site, the user expects, and should get, a completely usable transparent site that feels, and is, totally secure and reliable. The reality is that people are complex and enquiring, the web is as much a form of art as it is a corporate world and it is up to designers and artists to push those boundaries and come up with innovative exciting concepts. That is the nature of mankind. And the nature of the web has become a complex amalgamated representation of the many natures of mankind, blending and bleeding into and around each other.

5.4 Hilary Brace

http://hilarybrace.com

I have positioned this site to the far left in my continuum as it uses a button navigation system that is easily understood and is the most conventional of the sites I am analysing.

The site showcases the works of an artist who creates richly toned, detailed charcoal drawings (she calls them "landscapes"). The works carry suggestions of twisted cloud towers, intimations of tornados and waterspouts, visions of waves and mountains and hints of mysterious tubes and tunnels. Art in America has described the work in a poetic way:

> The subjects of Brace's works have all the grandeur and physical drama of a Yosemite or Grand Canyon but none of the specificity. These are nameless, placeless spectacles staged by clouds but suggesting such continuity between states of matter--solid, liquid and gaseous--that they are equally convincing as skyscrapers, seascapes or sometimes landscapes. Rarely does a horizon assert itself; there are no cues to

> scale. Clouds in billows, drifts, waves, tendrils and wisps fill each small frame. In one drawing (all are untitled, charcoal on Mylar), a dark, clotted ring of cloud hovers around a searingly bright core. In another, a veinlike crevice splits a tilted plane, inhaling vapor from above. (Ollman 2001)

The fading alternation between the text “CLICK ON THE IMAGE TO ENTER” and “All images of work herein © 2001-2006 Hillary Brace, All Rights Reserved” reflects both an understanding of possible user confusion as well as revealing a fear of the theft of her art. The image is a very powerfull one visually, it is somewhere between reality and fiction, accessible art (being on the net) and untouchable art (by clearly and immediately asserting its copyrighted status).

The ‘intro’ is simple, undisruptive and over quickly enough to forestall any possible impatience. Yet it maintains a highly artistic element and comments cleverly and creatively on the background piece by turning it from a visual focus to a visually soft aspect. (see fig 5-4.1) The navigation system is similar in character, clear, simple and obvious, whilst highly artistic and radically different.

The website is visually very soft, with the visual focus being defined by the user. Entirely in black and white right from the introduction page it mellows to soft shades of grey. The use of colour as a rollover (see fig 5-4.2) in the homepage navigation squares gives the user visual control as does the darkening effect of rolling over an image in the image libraries. Colour and then an additional highlighting by way of a grey circle around the ‘back button’ arrow makes it more visible when it is needed and not before.

The artist creates a very stark environment for the showcasing of her work by displaying it upon a white field. This gives the image on show top priority and serves to draw the user in deeper. The lack of a back button and the delay of the title, medium and copyright text adds to this. The audience is now captured on the page and may only leave by using their own browser back button or realising the whole image is a ‘hand cursor’ defined link space. Curiosity drives the user forewords, to click upon the image, only to be returned to the library from whence they came.

Ownership is a complex problem on the web and Brace combats this through the obvious statement of copyright on the first page, abbreviated mention of it on every image and by embedding it cleverly in flash so that it is un ‘copy-able’ to the average user.

In the real world Brace works in charcoal erasing into charcoal-blackened rectangles, creating cloud forms that pile up into what seems like celestial cloud scapes. She draws on polyester

film, starting with a completely darkened surface and pulls the forms out by subtraction and removing areas rather than addition. Unfortunately the medium has not translated into electronic format very well. The gritty feeling of charcoal has been lost. The viewer has no real idea of the medium used and having the thumbnail images greyed out causes the images to lose more of the charcoal feeling.

The original drawings are small in scale, and this sense of scale has not been portrayed well in the website, the only information is the size that appears in the titles that give details about the drawings in much the same way a conventional gallery would. Every drawing has been left untitled; the labels about the drawings refer to them all as “Untitled”. There seems little point in labelling them in this way; perhaps if they were given interesting names it would create some mystique around the artwork. I found that abstracting the drawings to the point of them being nameless did not add any value to the works it actually becames annoying.

Yet at the same time it gives them a naive ambience. A lack of title on every piece heightens the creative imagination of the viewer and forces them to create their own story, perhaps their own subliminal ‘title’ to the piece. By describing them as cavernous, cloudy, having tendrils drift away; the user is superimposing their own experiences and expectations upon the pieces. Drift implies movement in a still image, cavernous implies it is below ground and thus places the image physically somewhere, as does the term cloudy. Perhaps by denying the pieces a title the artist heightens more imaginative audiences to make their own, interpret the pieces ‘cleanly’.

The page layouts are rather conventional, thumbnails of the art works are displayed in a grid layout, nothing interesting other than the greyed out image becoming darker happens on rollover. It is rather boring and a more dynamic layout would add interest to the site. The background is white with nothing else of interest to see other than page titles and conventional looking button.

The mechanics of the site are that there is an initial splash screen that really serves no purpose other than containing the artists name, a “click to enter” message and some copyright information; the site could just as easily open with the main navigation screen. Once you get to the main screen there are five buttons that display headings in the rollover state, not very useful if you do not notice them appearing at the top of the screen. These may be more useful to people with vision issues if there was some audio attached that a screen reader could pick up.

The site uses a Flash interface that is meant to be simple and enigmatic. In practice it is rather clunky and awkward to navigate. You first have to mouse over squares to see what the categories are, you then have to click a thumbnail to see the image. In a rather unintuitive way you need to click the image to return to the thumbnails and then look for a small arrow below that returns you to the selection of categories.

There is some level of accessibility in the site in that once you get past the splash screen and first “home page” screen, you can use the tab key to navigate and the space bar to “mouse click” This offers a limited sort of alternative navigation.

The artwork is mysterious and interesting; Ken Johnson of The New York Times says “Once in a while you come across an art of such refined technique that it seems the product of sorcery more than ordinary human craft. It may be exaggerating to characterize Hilary Brace's small charcoal drawings this way, but it does suggest something of their beguiling mystery. (Johnson 2002)

Little of this mystery has been carried into the virtual world, better design of the interface, the use of music or of sounds could create a feeling of sorcery and beguilement in an on-line gallery.

Figure 5 Brace - Initial image

Figure 6 Brace - Main navigation portal

5.5 Vasarely website

http://www.vasarely.com/

I have chosen this site to be situated to the mid left in my continuum as it uses a timeline navigation that is easily understood. The audience for this website would be fans of the artist's work and people wanting to know more about his work and life and may be of an older generation. It is easy to grasp the concept of navigating the site as there are rollovers on the dates that change the color, but there is not enough contrast for color blind people to see it as other than the same shade, so it could be considered an accessibility issue.

The Vasarely website that showcases the artists work can be described as being rather conventional in that it has an easy to use navigation system. In general some effort is required to work out how the system works but once that has been accomplished the site can be navigated with relative ease.

There is a rather boring 'skip intro' bit that plays, a device that has been rather overused as a delay tactic to get users to wait while more content is loaded as previously discussed (McAlester and Capraro 2002). A rework of the intro page seems to be overdue. Users are

becoming more sophisticated and visitor numbers may be a clue as to what effect this is having (see fig 7).
Entry to the site could be improved by doing away with this now notorious strategy. You also have to “enter” the site twice, not very user friendly (see fig 8).

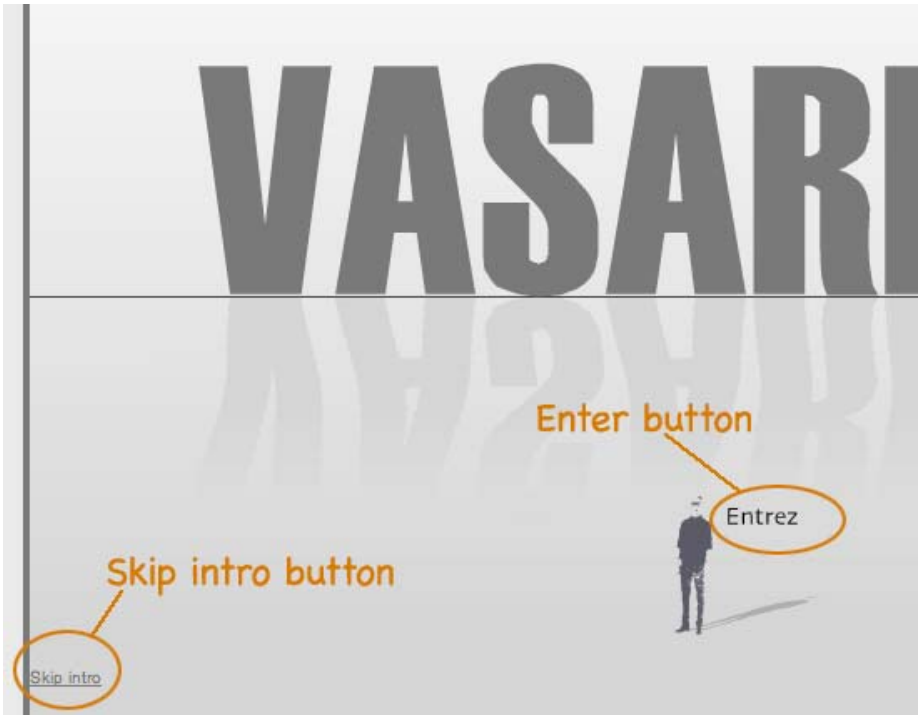

Figure 7 Vasarely Splash screen

Figure 8 Vasarely Second enter screen and button

The use of intriguing sound bites in the background distracts the user from the frustration of a loading page. Interesting and demanding of rapt attention they take you away from your current

environment and put you into his world through his daughter's voice, as long as you have your sound turned on.

The complexity of the site, in terms of download time and bandwidth usage is a fallback. The site is slow to respond and the user needs to exhibit much patience to view what they want. Perhaps this is reflective of the artist's relaxed French style and epitomised by the laid back background music.

Experience of the site found that some of the more outrageous aspects of the navigation overrode common sense and nulled expectations of 'common' systems that also existed. It can be described that "It seems silly but the 'back' text on the menu cube is almost invisible to the unsuspecting viewer." Once frustrated and attempting to click upon another cube I found at first that the cube was frozen and in fact it seemed the whole page, save for the reassuring background tones, had gone dead. Only once I relaxed and began looking and trying to see, did I notice the simple black clickable text "Back" which indicated the cube was frozen to make the sub menu possible.

Once the unusual navigation system is mastered, however, ease of use is undeniable. The abnormality and eccentricity of the system in no way hinders use, it simply forces the user to think and explore outside the box of their norms, or in this case within the cube at the top right.

Like many sites the system is not limited to one singular area or tool, but rather a multiple mode of navigation systems that form a net over the site. The navigation cube in the top right, its drop down sub menu list which freezes the cube and required an action to activate it again, the timeline along the bottom, the constant "NEWS LETTER / INSCRIPTION" links on the bottom right, the sound system controls, the "French" language button, and the "download text and photo" link which appears when appropriate.

5.6 Pin Up Toons

http://www.pinuptoons.com

According to Norman (Norman 1998) an affordance is the design aspect of an object which suggests how the object should be used; a visual clue to its function and use.

> ...the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used. [...] Affordances provide strong clues to the operations of things.

> Plates are for pushing. Knobs are for turning. Slots are for inserting things into. Balls are for throwing or bouncing. When affordances are taken advantage of, the user knows what to do just by looking: no picture, label, or instruction needed. (Norman 1998)

Further examples of an affordance in the digital realm are the icon of a trash can on the desktop of your computer, the folder icon, you know what they are for with little explanation.

Rion Vernon uses affordances to portray his particular style of art to his audience. In homage to old school methods he uses traditional ways such as sketching to create his work, yet he simultaneously embraces the most modern technology, such as having his own blog at myspace.com. He also sells his art and creative soul, so to say, by being very actively involved in marketing within his site, both his own works and that of sponsors and affiliates. He has created tee-shirts and prints to purchase, as well as a playing card series both for himself and the Suicide Girls line (http://suicidegirls.com) Vernon also plays his own trumpet by featuring links to interviews done with him on his 'About' page.

His site navigation systems are very abstract and require much test and play interactivity, but they are fun, real, easy to spot even if the affordances are obscure at times and the page graphics load fairly quickly. Whether intentional or not, the images that are hidden navigation systems actually load first and the 'background' then fills in and becomes indistinguishable until the user rolls over an interactive space. An example of this is the 'interviews receipt' in the about page which reacts with black dots appearing on the left of the text as well as a hand cursor. The 'YAHOO!' logo is almost invisible until rolled over, at which point it flares up with colour and a fluorescent yellow glow; in the 'gallery' section the affordances of a sketch pad, digital pad, drawing book and camera become a horizontal navigation system which is highly interactive and very visual.

Attention to detail and the site's visual reactions are intricate, extensive and highly creatively expressive. From, the monthly changing pin up toon on the 'homepage' to hand written text and sketchy pencil circling of scrap paper navigation tools. some interactions and reactions require user interaction and action, whilst others occur on their own. A truly dedicated fan or user would return early each month to view the latest pin up, like flipping a 'pin-up' calendar every month. Vernon has attempted to created and foster an active and captive audience response.

Vernon likes to mix his media dramatically and force the user outside of expectations. This is highlighted both through his abnormal and hidden/unexpected navigation systems through to the recent addition of his almost 'normal' links page with underlined, blue text hyperlinks superimposed upon a telephone contacts book image, receiver included.

Figure 9 The home page of Pinuptoons

Figure 10 Pinuptoons -The affordances add visual textual clues on rollover

5.7 Diesel

www.diesel.com

Diesel dreams features the work of 30 filmmakers who were commissioned to create short stories for Diesel's promotional DVD for their 2004 catalogue. Renzo Rosso is the man behind the Diesel clothing company and the person behind its success; the business is very much a family affair although it is a global corporation. Their success lies in a large part that their

advertising does not just try and sell, but it also tells a story. Rosso himself says “Success means being genuine” (Diesel 2005) and the work used in the campaign is that of unknown or little known artists being given the opportunity to make a name for themselves. The work was also available on a website that has since been removed and is now available on a DVD that accompanies the companies book, Fifty, published to celebrate fifty years of business.

The company is very supportive of artists and for this project design teams were called on to create short films based on imagery from Diesel's 2004 catalogue. Diesel provided all of the participating artists with different photographs from the print campaign.
Design collective Lobo (http://www.theebelinggroup.com) is one of the studios that Diesel called on to create a short film. In Lobo's case, the design team created the film “Acid Pigs Fly Over Me”, which looks inside a sleeping mind. The various artists who created a film all received a Polaroid of a different person sleeping, for Lobo it was a woman lying in the middle of a zebra crossing asleep, as the shadow of a bird flies above her. The team then used a hand-drawn look to create the surreal piece. The image was rendered into bleached-out black and white and continues with a black and white hand-drawn fantasy animation including balloon-like pigs floating in the air, drifting by a series of nonsensical technologies looking like something out of a sixties LSD induced hallucination. (Post 2004)

Acid pigs, as do all of the movies, starts with an image of a person who is sleeping. (see fig 11) The sleepers are all wearing the latest fashions from Diesel and are laid out in an urban landscape. The interface uses continuous medium to show the dreamers in this landscape. By clicking on a sleeper we can penetrate their dream and view what the filmmaker has created. We delve into the minds of the sleepers to view their dreams and hidden desires, some are erotic such as “My sky is erotic” and some are narrative dreamlike stories like “Acid Pigs Fly Over Me”.

The website lays out the dreams in a simple yet effective catalogue style interface; clicking on the hidden hotspots allows the viewer, in a voyeuristic fashion, to penetrate the mind of the dreamer. The site also includes a dream generator, (see fig 12) a secondary navigation device, where the viewer chooses a theme from a generated list. The interface succeeds in giving us the feeling that we are partaking of the dreams of the dreamers, the interface enhances the story by allowing us to choose whose dream to penetrate. My gallery will use the idea of a landscape as the area containing hotspots that can be clicked on to navigate and penetrate deeper into the interface.

Figure 11 Diesel - Sleeping people in a section of the urban landscape

Figure 12 Diesel - Zoomed in to view the Dream Generator

6. African Safari - an interactive Gallery based on continuous medium.

6.1 Why have a virtual gallery?

Shedroff (Shedroff 2001) argues that Interaction Design is essentially story-creating and that telling stories is at once both an ancient art, and a new technology. He talks about how one of the most important skills for almost everyone to have in the future will be that which allows us to create valuable, compelling, and empowering information and experiences for others.

Media have always effected the telling of stories and the creation of experiences, but currently new media offer capabilities and opportunities not yet addressed in the history of interaction and performance. In particular, the demands of interactivity are often misunderstood by all but the most experienced storytellers and performers. How these skills are expressed through interactive technologies and what demands and interests audiences will have for these remains to be understood. Consequently, there are also few sources of information about these issues and the techniques used to meet them. This is new territory that is desperate for some new ideas and cogent explanations. It is also the most critical component to the success of interactive products. (Shedroff 2001)

We may be good artists or storytellers, but being able to share our creations in new and compelling ways will be ever more important. Just as the spoken word evolved to the written and cave paintings to portable art works, we need to find new ways to reach our audience.

Through the ages people have used what they had available to convey their message and I would like to explore how a different culture and people used the technology they had at the time to convey their message. Wilford talks about (Wilford 2003) an example of a very different medium used to convey a message. The Inca of South America appeared to lack a written language until new research into Khipa, cryptic knotted strings was conducted. They are now thought to be the Incan way of encoding and recording information.
The knots are unlike anything we know and use today. In the conventional view of scholars, most Khipu were arranged as knotted strings hanging from horizontal cords in such a way as to represent numbers for bookkeeping and census purposes. It has always been assumed that khipu were textile abacuses.
A new, deeper searching analysis of 450 of the 600 surviving khipu has questioned this interpretation. A growing number of researchers now think that some khipu were non-numerical and may have been an alternate form of writing. When you create an email, it exists inside your computer in the form of eight-digit sequences of 1's and 0's. This coded message is sent to another computer, which translates it back to what was typed by the sender. The Inca information, Dr. Gary Urton of Harvard says, appear to be coded in seven-bit sequences.

Each sequence could have been a name, an identity or an activity. With the possible variations afforded by string colors and weaves, Dr. Urton estimated, the Khipu makers could have had at their command more than 1,500 separate units of information.

If these Khipu could be interpreted, they could contain the lost narratives of the Inca Empire, from before the Spanish conquest in 1532. The most amazing thing about them is that they are encoded in a way similar to the technology used by computers today. The fact that an ancient bronze age culture could leave such a long lasting message, has inspired me to make an equally long lasting record using the technology I have at hand today.

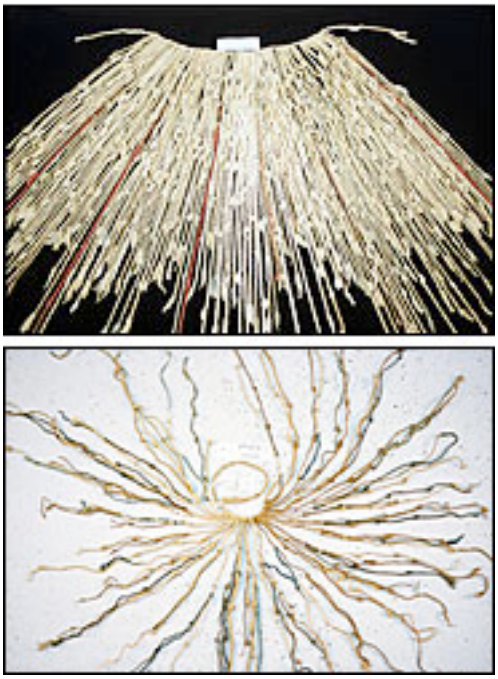

Figure 13 Images of Khipu
http://www.ee.ryerson.ca/~elf/abacus/inca-khipu.html

As well as reaching our audience, we need to consider what they are able to understand and what their needs and expectations are. This in turn helps us to reach them. The Incans had a complex and intriguing system unlike any other; the people who understood how to interpret the Khipu had no problem doing so. What we produce as artists, storytellers or designers is not just about us but also about what the audience will experience. I hope in my work I have created artwork that can be viewed in a fun and interactive way that is relevant to today's digital world, an alternative to static work such as a book. I have looked to artwork from the past, that can reflect the type of interface I want to create in a digital form and incorporated these ideas into the design of my gallery.

6.2 Medium Types

Medium types are an ancient concept and interactive media is just the most recent in a long line of new discoveries through the ages. Medium types can consist of things such as digital art, skin art, themes, wallpaper art, traditional art, photography, poetry/prose, fine art, music. An example of continuous medium is a papyrus scroll. Frescoes on walls or paintings in Egyptian tombs are also continuous media. Continuous media has been a source of interest to me as it relates to an image that can be extremely long. I have based my gallery on this type of media as it fits better with the context of creating the feeling of moving through a landscape.

In contrast to this, printed material, such as books and magazines, are all paged media. So are slideshows, where a series of slides are shown one at a time.(Meyer 2004) Of the sites I analysed, Vasarely and Diesel use a form of continuous media and Pinuptoons and Hilary Brace use paged media styles.

Possibly in the future, more continuous media will be used, as it is easier to scroll on smaller devices than navigate page by page. Apple has created an interface for the new i-Phone that deploys continuous media to scroll through functions and content. A video demonstrating this can be viewed at their website http://www.apple.com/iphone/internet/

Figure 14 i-Phone 2007

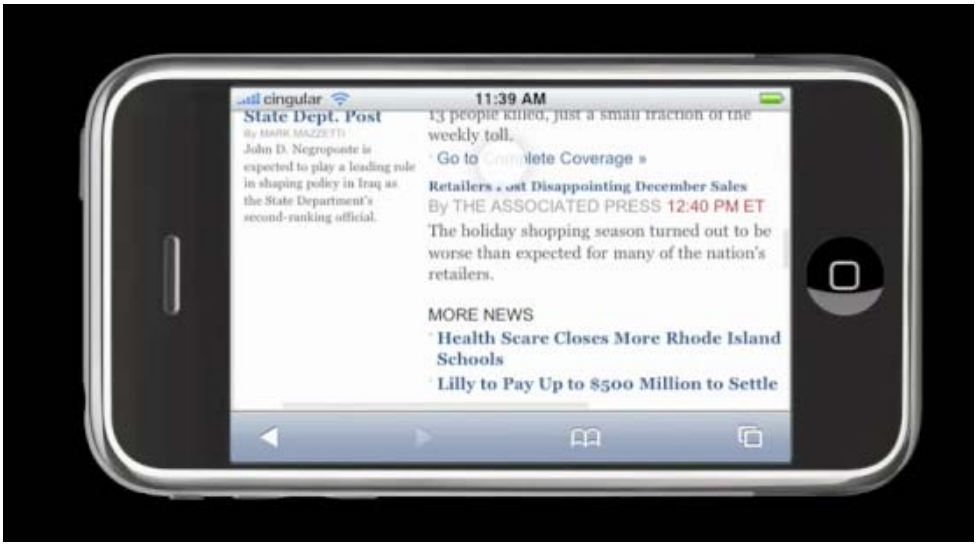

Figure 15 Scrolling through the newspaper on the new iPhone interface

6.3 The type of interface

Side-scrolling refers to a game genre, where the world being depicted is viewed from the side. The best known example of a side-scroller game is Super Mario, still available today in various versions. The character moves from the left to right through a landscape that extends well beyond the limits of the viewing area. The landscape scrolls past in the background while the player jumps or flies over various obstacles and bad guys, landing safely on platforms to collect treasure, food, or to rescue the Princess.

6.4 Side Scrolling

Moon patrol, released in 1982, was another simple graphics game, where you drive a buggy across the moon's surface. The goal is to avoid falling into craters by jumping your buggy over them. You also need to shoot down alien spacecraft before they can drop bombs on you. In the design of the interface for my gallery I don't have any bombs falling, but I drew on this concept in that the navigational area at the bottom of the screen scrolls. When you click on a hidden hotspot the top area navigates to the matching large version point, so you can view the chosen image.

Side scrolling could claim to be the first example of digital navigation; Nintendo released the first Mario brother's game in 1985. Players were introduced to huge, bright, expansive worlds that changed the way video games were created, played and perceived. In January 1983 Apple introduced the Lisa, this was the first interface for mainstream computer use with pull down menus and menu bars. The first Windows program for the IBM PC was not released until 1985.

In 1987 Apple introduced the Apple Macintosh II, the first color Macintosh. The games environment was ahead of the computer interface. Navigation and the use of a graphical user interface were first conceived of in the side scrolling game arena. I spent many hours in the 80's playing Moon Patrol and was always fascinated by the way it worked, I have now been able to deconstruct the idea behind it to use in own interface.

Figure 16 Mario brothers game
http://en.wikipedia.org/wiki/Super_Mario_Bros

Figure 17 Moon patrol game
www.eightyeightynine.com/games/moon-patrol.html

6.5 The Project Interface

The project I am submitting is called “African Safari” and its navigation system is based on the side-scrolling device in the vein of the old-school Nintendo and Sega games such as Mario Brothers. Users can navigate through an environment that displays the artworks in a continuous scrolling interface. African Safari also draws inspiration from other places, where only a part of the environment is shown. When one views a scroll, where only one part of the work is revealed at a time, there is a mystery attached to this, as much is still hidden and can be explored. The scroll can be unrolled from one end and rolled up at the other end revealing only a part of the story at any one time. Much like an ancient Chinese hand scroll or a Jewish Torah scroll.

My Gallery has the same format as Chinese hand scrolls - a long horizontal format. Hand scrolls have a continuous horizontal surface of silk or paper on which the painter or calligrapher develops a composition. They are often displayed in their entirety in museums, but hand scrolls are meant to be viewed by only one or two people and unrolled from one side to the other two or three feet at a time. In this way, the viewer may travel through a story or landscape that conveys the progression of time. Separate papers containing titles may also be attached and the complete scroll is mounted on a silk board. A wooden dowel is attached on the left end of the scroll and a semicircular rod at the other end for rolling and unrolling while viewing. After viewing, the scroll is rolled up around the dowel from left to right and secured with ties. The interactive Gallery follows in this tradition; the computer screen allows for one or two people to view an artwork at a time, only one person can operate the mouse. It is a personal journey and experience. The thumbnail environment that the viewer navigates is reflected in the top section of the interface where a small portion of the horizontal landscape image can be viewed one part at a time.

Torah scrolls are parchment scrolls made of animal skins that are always hand-written in Hebrew calligraphy. (Greene 1991) You are not supposed to touch the parchment on these scrolls. The reasons given for this are either that they are too holy, or that your fingers sweat contains acids that would damage the parchment over time. Instead, you follow the text with a pointer, called a Yad. (Yad means hand in Hebrew) The pointer is usually in the shape of a hand, with a pointing index finger that looks uncannily like the computer hand icon users are familiar with. The scrolls are kept covered with fabric, and often ornamented with silver crowns on the handles and a silver breastplate on the front. They are obviously objects of great value, as well as holiness and mystery. The Gallery also uses device similar to a Yad as a pointer. The Yad for the Gallery takes the form of the image of a bird, that follows the mouse. This bird turns

in the direction the user moves the mouse and faces towards the front when the mouse is not moving.

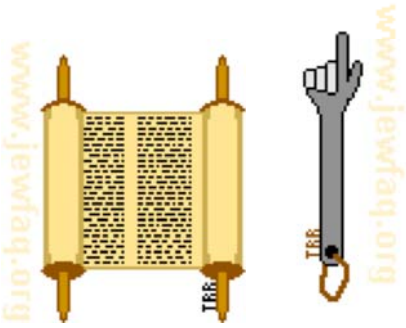

Figure 18 Torah and Yad
http://www.jewfaq.org

Most people know what direct manipulation is through their experience with graphical computer interfaces. The Gallery interface is intuitive enough, that people who have been exposed to computers and have experience in manipulating objects directly on the screen by pointing at them with the mouse, or rolling over them and clicking on them, need no instruction in working out how the system works. The user is in control in a world of passive objects, which they can manipulate as they want, within the boundaries of the design of that interface.

In the case of the Gallery the user is the one who needs to explore and retain control of the environment through direct scrolling along the timeline, then clicking on area of interest.

6.6 How does it work?

The project part of this research is the design and construction of an interactive Gallery that showcases the artworks. The artwork is created in a style that is Naïve, characterized by a simplified style, non-scientific perspective, bold colors and a simple approach. Naïve art often has a childlike vision; this is not to say it is aimed at children. The chosen style is aimed at people of all ages, although children often do identify more strongly with this style. It is a style I have developed through time and used in my previous work, where I created hand painted dinnerware. The feeling I wanted to convey was one of happiness and also that there is a story behind each artwork.
The Gallery is contained in an endless scrolling loop that is the environment for the Gallery. The guide is a bird, which follows the mouse, like a character in a game. This character is contained in a thumbnail sized version of the environment below the larger version. This area scrolls in a loop, that seems to have no end. This creates the result I wanted to achieve of an endless landscape with a seamless effect.

The art works are available in sections that the user navigates to on screen. The navigation for viewing the artwork is showcased within the small lower area. The bird follows the mouse movement and works as a Yad or host. Clicking on an area within this section accelerates the large environment to that position on screen. The reward for the user is being able to view each work in large format in the top window. They can then explore areas that have hotspots that show simple animations. The viewer is also able to click on an icon to reveal a short poem about that particular artwork.

The environment is designed to allow the user to interact with it in a way that stimulates their interest and curiosity about the portfolio and the work it contains.

The housing of the Gallery is the digital environment and the alternative to how it would normally appear in, if it were the real world, such as if one were turning the pages of a book. The artworks are a digital version of what would normally be found in the pages of a book. This virtual Gallery however, is not a direct translation of the real world into a virtual world using analogies or affordances from the real world like images of walls and floor plans, rather it is designed as a game-like world. When the user clicks on a thumbnail, it is possible to anticipate, before clicking, what kind of event will take place. In a conventional layout all clickable areas would be buttons with labels. For the Gallery the mystery and intrigue is part of the design, so there are no labels or menu items.

The feeling I wanted to capture is one of being in a landscape on a Safari adventure through Africa.

6.7 Building the Interface and creating the artwork

The artwork is created digitally using:

Wacom Cintiq - An interactive pen display combined with an LCD display. The device uses a pen directly on the screen allowing you to work much more quickly and naturally. Combined with software like Painter you can draw directly on screen.
(http://www.wacom.com/cintiq/index.cfm)

Photoshop - A professional image-editing and graphics creation software from Adobe
(http://www.adobe.com/products/photoshop/family.html)

Painter IX - A powerful Natural-Media® painting and illustration software—featuring unique digital brushes, art materials and textures that mirror the look and feel of their traditional counterparts.
(http://www.corel.com/)

Initial drawings of the animals was done using pen and paper, they were then scanned in and used as a reference (see figs 19 and 20). Using a combination of the hardware and software, all the final artwork was created in a digital environment. All the paintings were created digitally using the Wacom screen and a combination of Painter IX and Photoshop. The paintings were created at a large size and reduced down for the digital environment. This was done so they could be used for print later. I envisage the artwork being made into a book later with an accompanying CD that allows for interaction. The artwork had to be accurate in size to the exact pixel so that it could work correctly within the interface, which was then created in Flash.

Figure 19 Initial sketch of monkeys

Figure 20 Initial sketch of giraffe

The interface is created using:

Flash 8 - The working interface is constructed using Flash®. An advanced authoring environment for creating interactive websites, digital experiences and mobile content. It is designed to help creative professionals design and author interactive content rich with video, graphics, and animation. (http://www.adobe.com/products/flash/flashpro/)

Flash was used as the authoring tool for the actual gallery, using code and graphic images instead of canvas paintings and an actual building of the work is displayed in it's own virtual

world. The code used in Flash is a combination of elements created by myself with a scroller component from Scottydawg (http://scottydawg.com/) that was adapted to work the way I needed. Code review was done Shane Maiolo, who helped with some of the functionality. Some of the issues that arose during the building of the interface were due to limitations of the software. The software was not designed to accommodate such a large image; the scrolling image is one piece of artwork 13,500 pixels across and could not be viewed onscreen. This meant that adding elements like the drop down boxes which display the poems, had to be "nudged" along the image until they were in the correct position.

Dreamweaver – This is HTML authoring software from Adobe enabling easy creation of websites containing graphics and multimedia elements.
(http://www.adobe.com/products/dreamweaver/)

Dreamweaver was used to create the interface to hold the gallery and to create a navigable DVD that contains other relevant information.

The font

The fonts used in the interface are Pussycat, Roger and Roger outline.

Figure 21 Fonts used in interface

The music

I am not a musician but using Garage Band I have created a short music loop to add ambiance to the project.

The poems

Poems were created to enhance the storytelling of the actual paintings. The poems were commissioned by myself to accompany the paintings and were created by Milan Havlik.

7. What does the future hold?

It seems that with the advent of applications and sites like youtube, blogging, flickr and myspace more people are able to put their content online without having to worry about how to design a look and interface or program the functionality. It is getting easier to use an existing application as the container for one's work. I am sure there are even ready-made art galleries being developed at the moment; a person will just choose one them and load up the work to be displayed, much like choosing a brick and mortar gallery in the real world.

7.1 Web 2.0 Applications

Web 2.0 is a term that was first used by Tom O'Reilly of O'Reilly Media in 2004. (O'Reilly 2005) The concept of "Web 2.0" began with a conference brainstorming after the burst of the 2001 dot-com bubble. It was noted that far from having "crashed", the web was more important than ever. Exciting new applications and sites with new features were popping up. The companies that had survived the collapse seemed to have evolved and it was obvious that the dot-com collapse marked some kind of turning point for the web. There are now 389,000,000 references to Web 2.0 in Google (15 March 2997). O'Reilly talks about Web 2.0 as not having a hard boundary, but rather, a gravitational core, a set of principles and practices. These tie together a solar system of sites that demonstrate some or all of the principles that are demonstrated in one way or another by the successful features of web 1.0, and by the most interesting of the new applications. Web 1.0 examples as opposed to Web 2.0 are things like:
Britannica online vs. Wikipedia
Personal websites vs. Blogging
Content Management Systems vs. Wikis
Collaborative tools such as wikipedia and blogging allow for collaborative use. The web is now seen as a platform, where there are virtual communities, like Myspace. Users own data becomes the content that can be viewed, as in Flickr photo galleries. There is no need for the average user to have any knowledge of programming; lightweight, fast downloadable front ends are used to offer up many features not possible without the back end of hard core systems and programs. These are developed by experts and offered up for users to take advantage of. This can be seen in features such as displayed on del.icio.us, where one can save and bookmark pages. All your bookmarks are saved and accessible to those, whom you want to share them with. Being tied to one computer or system is no longer necessary; people can access their email, their calendars, their data online via programs like Google mail and calendar and .mac accounts.

Appendix 1

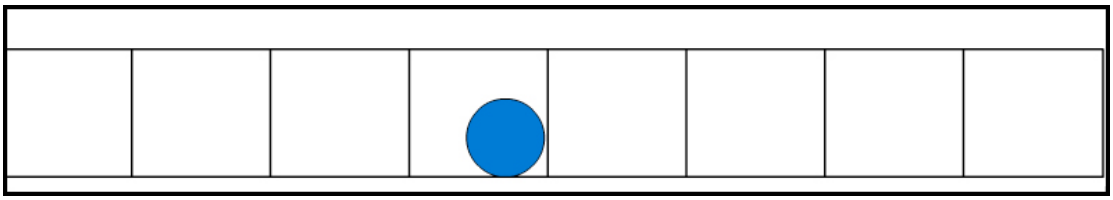

Figure 22 Hotspots 1
Designing the interface with hotspots, later made invisible to test the functionality of the host following the mouse movement

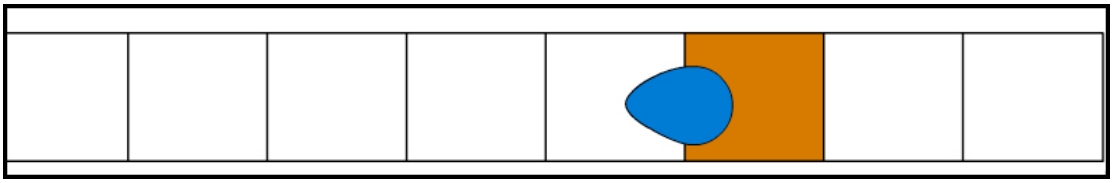

Figure 23 Hotspots 2
Hotspot showing the image turning left while following the mouse

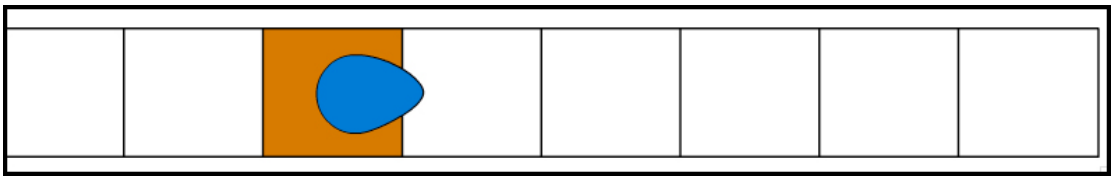

Figure 24 Hotspots 3
Hotspot showing the image turning right while following the mouse

Figure 25 Initial sketch for the host, later changed to a bird

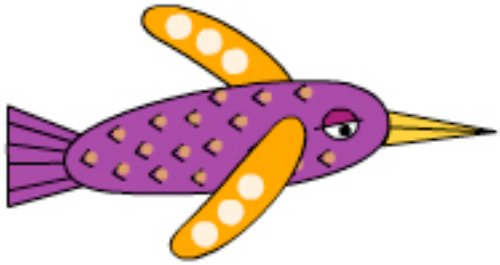

Figure 26 The bird host that follows the cursor

Figure 27 Initial simple background

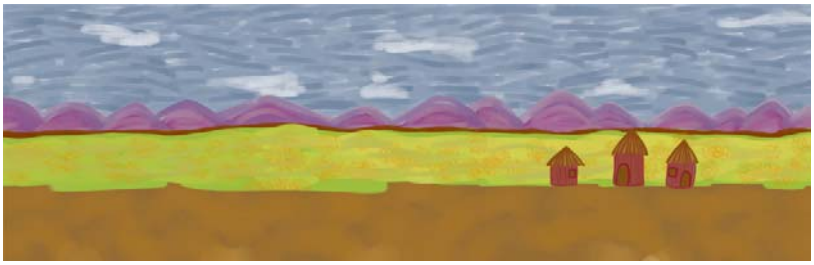

Figure 28 Final artwork for the landscape background

Figure 29 Menu design for the web interface

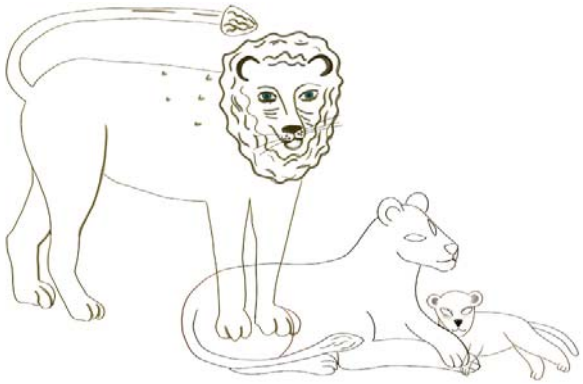

Figure 30 Lion artwork step one

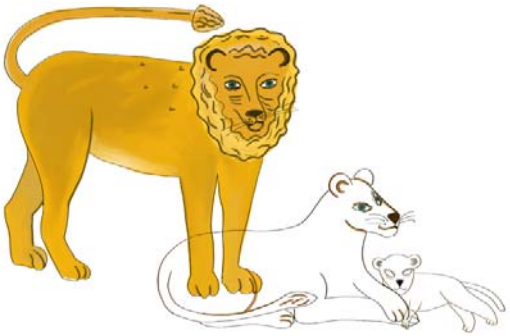

Figure 31 Lion artwork step two

Figure 32 Lion artwork step three

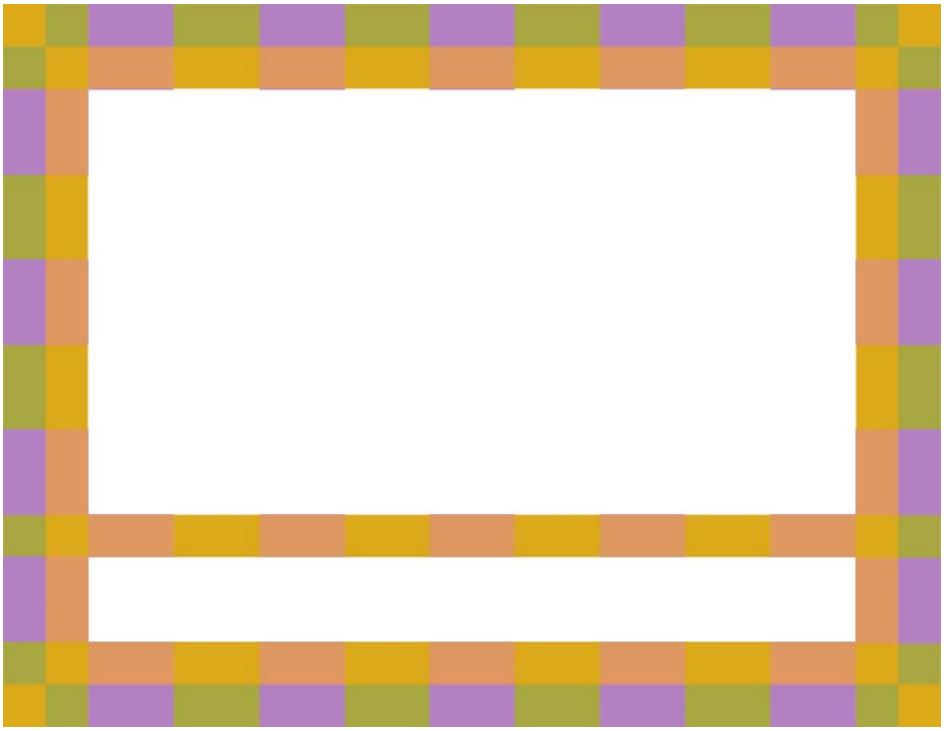

Figure 33 Initial frame design
Initial design for the frame, later replaced by a plain blue one, as it was too busy

Figure 34 Final design
The final design incorporating a bird instead of an angel, a simple blue frame, and the landscape background and artworks.

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